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NOTES AND NEWS

An Observation of Some Sugar Pine Relicts.—Near the shore of Anne Lake in the Minarets Wilderness Area of the Sierra National Forest, in Madera County, California, at 2,900 m, stands a sugar-pine snag of about 1.5 m diameter at ca 1.4 m above ground level, and about 30 m in height. A companion snag, also sugar pine (*Pinus lambertiana* Dougl.), about half that diameter and about 23 m in height, leans toward the larger snag close by. The strange thing about these snags is that there are no living sugar pines in their vicinity, nor other dead ones. Moreover, the larger of the two has a greater diameter than any tree, living or dead, in its vicinity. The neighbors of the two snags are trees of western white pine (*Pinus monticola* Dougl.), lodgepole pine (*Pinus contorta* Dougl. var. *murrayana* Engelm.), and mountain hemlock (*Tsuga mertensiana* (Bong.) Carr.). George B. Sudworth (*Forest Trees of the Pacific Slope,* 1908) gives 2,740 m (7,000 ft.) as the maximum elevation for sugar pine in the southern Sierra Nevada, and Willis L. Jepson (*The Trees of California,* second edition, 1923) gives 2,580 m. (8,500 ft.). Moreover, there are no sugar pines along the Fernandez Trail into the Anne Lake vicinity from Clover Meadow, 17.6 km to the southeast at 2,140 m. Anne Lake is shown on the Merced Peak Quadrangle of the U. S. Geological Survey's 15-minute series of topographic maps at Longitude 119°22′ W and Latitude 37°36′ N.

I identified the snags from bits of bark clinging to the trunks and more bark scattered on the ground around the snags, also from chips of wood cut from the larger snag. The identification of the bark was verified by Prof. Robert A. Cockrell, School of Forestry and Conservation, University of California, Berkeley. A sample of the wood was ground and analyzed by Dr. Arthur Anderson, of the Forest Products Laboratory, University of California (situated in Richmond, near Berkelay). He reported the presence of pinitol, which would suggest that the sample was sugar pine. No old cone parts were in evidence on the ground around the snags.

The two sugar-pine snags are situated among granite outcrops on an east-facing moderate slope on the west side of Anne Lake. Most of their small branches have fallen off. One of the larger snag's several tops has fallen to the ground and is well advanced in rot. This top may have been knocked off by lightning. No galleries of pine beetles were apparent on the weathered wood surface. It is difficult to estimate when the death of these trees occurred, but perhaps in the range of 25 to 50 years—certainly in decades rather than centuries. The larger may have been as much as 400 to 500 years old at death; the smaller, evidently suppressed, may have been about as old.

How does sugar pine happen to have grown at this elevation? We may theorize that this part of the Sierra had a definitely warmer climate several centuries ago, and that sugar pine became established and thrived. Perhaps birds or mammals including man (prehistoric Indians) in some way brought in the sugar-pine seed, which germinated under favorable conditions. The trees then survived during a period sufficiently favorable to grow to maturity.

It was most amazing to find these dead pines (in July 1972) far above the present elevational range of living sugar pines. I would appreciate knowing if others have made similar discoveries. A comparison of the annual rings of the sugar-pine snags with rings of the bristlecone pine (*Pinus aristata* Engelm.), in the White Mountains about 100 km airline to the east, would no doubt serve to date the period when these trees grew.—Richard H. May, 7 Neila Way, Mill Valley, California 94941.